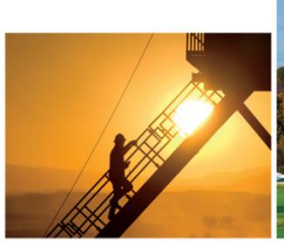





ENVIRONMENTAL DATA MANAGEMENT & SHALE GAS PROGRAMS

INTERNATIONAL PETROLEUM ENVIRONMENTAL CONFERENCE

NOVEMBER 14, 2013

Chesapeake ENERGY

earthsoft

AGENDA

- Project Design
- Stakeholder Issues
- Implementation
- Project Outcome
- Lessons Learned

CENTRALIZED DATA MANAGEMENT – KEY BENEFITS

- Accessibility – Centralized location, collaborative work space, global access (web-based), historical retention
- Cost Reduction – Reduce man hours to input, create, and distribute information
- Standardization – Consistency in format and presentation; data integrity
- Project Management tools– Ability to easily monitor project progress and data from a central location
- Collaboration – Increase ability to share data through web portal
- Communications – Easily communicate with stakeholders through online tools
- High grade project decisions – Facilitate cold eye, management review process

Better Manage Liabilities

- Eliminate redundant Legacy Systems – improve data integrity and reduces cost
- Hosted option, little or no desktop software required – internal IT requirements low,

Web based applications – allows for updates in real-time; eliminates versioning

CENTRALIZED DATA MANAGEMENT – KEY BENEFITS

By centrally managing all environmental data into a single storage facility, more sophisticated data analysis will be achievable, which leads to an improved technical/scientific understanding, while enforcing comprehensive QA/QC procedures:

- Technical data quality objectives, including data validation and checking is standardized and managed centrally.
- Electronic input and output of data improves data accuracy, efficiency and quality by reducing potential staff errors during transfer of data.
- More efficient workflow and field monitoring procedures become.
- Data is timely (real time), available for multi matrix (i.e. Air, Soil, Water, Ecology, etc) and of high quality.
- Data is readily accessible to all key stakeholders.
- The data management system stores, processes, analyzes, and reports project critical data necessary for both day-today project management and longer term strategic planning.

Financial Value of Consistency

- Save Time and Money
- Ramp monitoring programs up faster
- Share data between offices - no need for data translation

Increased Technical/Scientific Understanding and Time for more advanced Data Analysis.

Auditable traceability of data – Open & Transparent system.

PROJECT DESIGN

- **Historical View of Baseline Water Sampling**
  - State requirements and data needs
- **Understanding proper flow process**
  - Insert flow diagram
- **Process timeline**
  - Pre-drill scheduling
  - Post-drill scheduling
- **Database configurations**
  - Customized formats
  - Standardized formats
  - Sustainability for years to come

STAKEHOLDER ISSUES

- **Effective Data Management**
  - Ability to manage large amounts of data
  - Understanding the uses of the data
  - Building efficiency through reporting
- **Data Migration**
  - Migrating data from previous formats to singular format
    - Understanding the changes and limitations of previous stored data
- **New Data Storage**
  - Adjusting Work Flow
  - Change of Management process
- **Quality Control Mechanisms/ Assurances**
  - Ability to monitor and track progress/data completeness
- **Costs**
  - How to remain on task and budget

IMPLEMENTATION

- **Building the right project team**
  - Collaborative effort among consultants, labs, EarthSoft and Chesapeake Energy
  - Weekly team meetings
    - Phased implementation
  - "All hands on deck" approach for timely implementation
    - Ability to make changes immediately to maintain data flow/input
  - Project Checklists

PROJECT OUTCOME

- **Data Reporting Requirements**
  - Internal Reporting
    - Quarterly matrices (KPIs)
  - External Reporting
    - Exporting data to state databases (i.e. MSC)
- **Data Management Uses**
  - Water Quality data statistics
  - Quick retrieval of data for landowner questions or water source complaints

LESSONS LEARNED

- Build in time for uncertainty
- Fully understand the project tasks/desired outcome
- Active Project Management
- Focus on changeable topics (Don’t focus on the “what ifs”)